

**AMENDMENTS TO THE DRAWINGS:**

Please find accompanying this response replacement sheets for Fig. 3 wherein amendments explained in the Remarks presented below are effected.

**REMARKS**

The above amendments and following remarks are responsive to the Office Action of November 1, 2004. Reconsideration of the application and a notice of allowance are earnestly solicited.

The Examiner has objected to figure 3 and asserted that the figure should be labeled "Prior Art" and that reference labels 54-58 should be removed. The specification has been objected to because the Examiner asserts that "11a" on page 19, 10th line, should read "11". Applicant has provided a substitute drawing for Figure 3 and amended the specification to overcome the objections.

Claims 1 and 5 are rejected under 35 U.S.C. §102 (b) as being anticipated by Aoki (U.S. Patent No. 4,044,653) and the Examiner asserts, among other things, that the reference teaches a two-way pump P. Claims 1 and 5 are rejected under 35 U.S.C. §102 (b) as being anticipated by Nakamura et al. (U.S. Patent No. 5,443,782) and the Examiner asserts, among other things, that the reference teaches a two-way pump PV. The Examiner has rejected claims 2-4 and 6 under 35 U.S.C. §103 (a) as being unpatentable over Aoki. The Examiner asserts, without support, that it is within the level of the ordinary skill to use a plurality of two-way pumps in combination with a hydraulic circuit to control pressure in a fluid pipeline.

Regarding the rejections under section 102, these rejections cannot be maintained against any specific claim unless each element of the claim is taught by the cited reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987) ("a claim is anticipated only if each and every element as set forth in the claim" is found in the cited prior art reference).

Regarding the rejections under section 103, these rejections cannot be maintained against any claim unless the combined prior art references teach each limitation of the respective claim. *In re Royka*, 490 F.2d 981 (CCPA 1974) (a prima face case of obviousness is established only where the combination of cited references teaches or suggests each limitation in the claim). Based on this requirement, Applicant provides the following analysis and traverse.

Regarding the rejections under section 102 in view of Aoki, the reference describes, in relation to mold and metal forming, a common grouping of a hydraulic pump, a hydraulic cylinder, a limit switch and timer for controlling injection, and an electrical relay. Aoki, however, describes a control system that does not use a conventional valve combination.

Moreover, Aoki illustrates a pump P in figure 1 and discloses the same in column 3, line 15 et seq but the reference fails to state that the pump is a "two-way" device.

Regarding the rejections under section 102 in view of Nakamura, the purpose of the Nakamura is to improve injection initialization by having hydraulic pressure exerted in advance in the injection cylinder. Although two pumps are used for this purpose, the purpose of having two pumps is not to provide separate pumps, one for maintaining pressure during filling and one for maintaining pressure thereafter.

Moreover, Nakamura illustrates in figures 1 and 2, and discloses at column 4, line 43 et seq., a unidirectional pump and the labeling of the pump PV in Nakamura utilizes a well-known and standard illustration of a unidirectional pump. Nakamura however fails to mention a two-way pump.

As compared with Aoki, the present invention applies a two-way pump instead of a solenoid valve on IN and OUT sides of an injection cylinder and uses a servomotor for control instead of using a limit switch. Regarding both Aoki and Nakamura, these references concerning a conventional injection method of diecasting, wherein a constant-volume pump is driven by a motor, and hydraulic fluid is sent into a cylinder by opening a valve. The present invention, on the other hand, relates injection filling a molten metal with a diecasting machine employing a servomotor for a drive control and therefore high speed filling of diecasting. By using a two-way pump, hydraulic fluid on the OUT side of a cylinder can be sent into the IN side again, allowing for discontinuing the use of

valves, reduction of the amount of hydraulic fluid, reduction of impact at the time of injection and reduction in the size of oil tanks.

Moreover, as compared to both Aoki and Nakamura, pending claims 1 and 2 recite that the pump is a "two-way" device. Accordingly, the claim recites limitations not taught by either reference, and the rejections under section 102 (b) and 103 (a) cannot be maintained. *Verdegaal Bros.*, 814 F.2d at 631; *Royka*, 490 F.2d at 981.

Further regarding the rejection of the claims under section 103, these rejections are improper not only because Aoki fails to teach a plurality of two-way pumps as recited in Claim 2, but also because an unsupported rejection based on ordinary skill is only appropriate for the limited circumstances where the facts are capable of instant and unquestionable demonstration as to defy dispute. *In re Alhert*, 424 F.2d 1088, 1091 (CCPA 1970). However, in a circumstance involving new configurations of hydraulic equipment, such as with the present invention, the Examiner must provide concrete evidence to support such a rejection. *Id.*, at 1091; *In re Zurko*, 228 F.3d 1379, 1385 (Fed. Cir. 2001).

Claims 7 and 8 have been rejected under 35 U.S.C. §103 (a) as being unpatentable over Aoki as modified by Mizunaga et al. (JP 10-202354). Mizunaga is cited for teaching that "the two-way hydraulic pumps are

servomotors" which Applicant interprets as meaning that the motors that operate the plurality of two-way pumps are servomotors.

While it is true that the Mizunaga describes using a servomotor to control the speed and pressure of molten metal filling, Mizunaga claims a driving method via a ball screw instead of a hydraulic cylinder, and fails to otherwise disclose using a hydraulic pump and hydraulic cylinder at all. Moreover, as the diecasting process requires instantly filling molten metal into a die, the driving method via ball screw is not fully functional as a device because it is not secured against shock and will break in case of an unintentional sudden stop due to a malfunction of a die or irregularities in the state of molten metal during high speed injection (i.e., cylinder speeds of 0.5m/s or more).

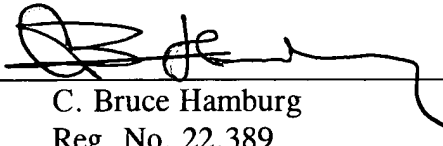
Moreover, in reviewing Mizunaga, the reference fails to teach a two way pump but rather illustrates in figure 1 and teaches in the translated abstract a unidirectional molten metal supply pump 20. Based on Applicant's interpretation of the rejection, the rejection cannot be maintained because neither Aoki nor Mizunaga teaches or discloses a plurality of two-way pumps as recited in pending Claim 1, which is the claim form which Claims 7 and 8 directly and indirectly depend. *Royka*, 490 F.2d at 981; *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 234 F.3d 558 (Fed. Cir. 2000) (a claim that depends from a prior claim incorporates all the limitations of that claim).

Applicant respectfully requests a one month extension of time for responding to the Office Action. Please charge the fee of \$120.00 for the extension of time to Deposit Account No. 10-1250.

In light of the foregoing, the application is now believed to be in proper form for allowance of all claims and notice to that effect is earnestly solicited. Please charge any deficiency or credit any overpayment to Deposit Account No. 10-1250.

Respectfully submitted,

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